DOCUMENT RESUME

ED 314 099 IR 053 067

AUTHOR Eisenberg, Michael B.; And Others
TITLE Trends and Issues in Library and Information Science, 1988.
INSTITUTION ERIC Clearinghouse on Information Resources, Syracuse, N.Y.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
REPORT NO IR-81; ISBN-0-937597-24-4
PUB DATE Dec 88
CONTRACT RI88062008
NOTE 44p.; For a companion study on educational technology, see ED 308 859.
AVAILABLE FROM Information Resources Publications, 030 Huntington Hall, Syracuse University, Syracuse, NY 13244-2340 (IR-81; $4.00 plus $1.50 shipping and handling).
PUB TYPE Information Analyses - ERIC Information Analysis Products (071)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Content Analysis; Elementary Secondary Education; Futures (of Society); Higher Education; Information Science; Learning Resources Centers; *Library Administration; *Library Education; *Library Research; Library Role; *Library Services; *Technological Advancement; Trend Analysis

ABSTRACT

This synthesis paper provides a state-of-the-art analysis of the field of library and information science based on the results of a content analysis of its literature, including selected journals, conference proceedings, dissertations, and ERIC input. The 18 trends and issues identified by the analysis include developments in technology, management, services, professional education, and research and theory. The following trends are discussed: (1) CD-ROM's emergence as a major technology; (2) the effects of technology on the work done by library and information science personnel; (3) the impact of technology on ways information is presented; (4) the incorporation of planning processes into library management activities; (5) increased concern about the quality of collections; (6) new ways to promote literature and literacy; (7) the need to incorporate technology as a method of bibliographic instruction; (8) libraries' attempt to provide quality literature and services to the widest possible constituency; (9) librarian's professional image and identity; (10) the expanded roles and responsibilities of library and information professionals; (11) the need to provide library education in specific areas; (12) continuing education opportunities; (13) the impact of "Information Power" on the school library media field; (14) the information professional's recognition of ethical responsibilities; (15) concerns of information retrieval; (16) new research involving technological developments; (17) the application of methods from related fields to the problems of library and information science; and (18) bibliometrics. (SD)

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TRENDS AND ISSUES IN LIBRARY AND INFORMATION SCIENCE 1988

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December 1988

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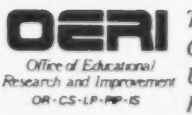
ISBN: 0-937597-24-4



This publication was prepared with funding from the Office of Educational Research and Improvement, U.S. Department of Education, under contract no. RI88062008. The opinions expressed in this report do not necessarily reflect the positions or policies of OERI or ED.

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Introduction

This monograph is the first of a bi-annual effort by the ERIC Clearinghouse on Information Resources to determine, document, and describe the pervasive trends and issues in the library and information fields. It is the companion piece to the trends and issues in educational technology monograph also published by the Information Resources Clearinghouse. Together, these two works provide insight for educators, researchers, and decision-makers into areas of current interest as well as some indicators pointing to future developments in the educational technology and information fields.

The scope of this monograph is confined to considering the trends and issues in library and information science that relate to education at all levels. A substantial range of interests are considered, from preservation of academic library collections to information skills instruction via school library media programs, to theoretical research on information retrieval systems.

For this publication, a "trend" is defined as a cumulative indicator of activities and/or products, with some indication of movement and direction. A trend is identified through such questions as: "What are the major concerns in the field? Where are professionals and researchers concentrating their efforts? What are the new developments and where are they likely to lead?" As trends develop, "issues" emerge. Issues are defined as problems, concerns, and questions for which there are two or more points of view. The emphasis here is on major trends as well as key issues related to particular trends.

The process for identification of trends and issues described in this monograph involved a systematic content review of the literature of the field, including:

- journals,
- conference proceedings,
- input into the ERIC document collection (RIE),
- annuals and yearbooks, and
- dissertations.

One of the caveats of using a literature-based approach to identification of current trends and issues is the problem of timeliness.

There is often a considerable time delay between the actual writing and the publication of a document, calling into question how "current" the trend actually is. In an effort to overcome the timeliness problem, the literature survey included conference proceedings and input to the ERIC database, two sources with relatively short timespan between writing and publication.

The exact methodology for the literature survey draws from the techniques of content analysis as well as Naisbitt's approach to uncovering "megatrends" (Naisbitt, 1982). The complete methodology is explained in Appendix A.

General Comments on Approach

To facilitate the literature analysis, an instrument was designed for recording the topical emphasis of an article, paper or conference session. The broad topical headings were:

- the field,
- personnel,
- management,
- technical developments,
- instructional processes/services,
- services, and
- research/theory.

More specific subtopics were listed under each of these.

This breakdown also permitted a rough quantification of the emphasis given to each area in the literature. Chart 1 presents a summary of findings for each of the sources analyzed. The areas are listed from high to low, i.e., those broad topics receiving the most attention (technical developments, management, services) are listed first; those receiving minimal attention (instructional processes/services, research/theory) are listed last.

Interestingly, the overall, general concerns expressed in the literature of library and information science parallel the general concerns in instructional technology. Yet there is little overlap between these two areas on specific trends. For example, as might be expected, computer technology was important in both areas. However, the specific trends in library and information science focus on the changes taking place in information resources and services while specifics in instructional technology relate to applications in curriculum and instruction. Concerns about the

TRENDS BY TOPIC AND SOURCE

TOPICS	Journals	Confs.	RIE	Annuals	Dissts.	Total	Percent
Technical Developments	**45**	**49**	**21**	**2**	**7**	**124**	**22%**
General	1	14	1			16	3%
Computer Related	43	32	16	2	7	100	18%
Telecommunications	1		1			2	0%
Video		2	1			3	1%
Audio		1	2			3	1%
Management	**31**	**37**	**42**	**11**	**2**	**123**	**22%**
General		11	2	4	1	18	3%
Organization	5	2	3			10	2%
Logistics/Operations	2	1	4			7	1%
Procedures/Policies	2	4	8			14	2%
Facilities		2	1			3	1%
Finance/Budget	2	1	1	4		8	1%
Planning Processes	9	7	11	2		29	5%
Collection Management	11	9	12	1	1	34	6%
Services	**28**	**23**	**66**	**3**	**0**	**120**	**21%**
General	1	4	7			12	2%
Lit. and Rdg. Guidance	3	6	2	3		14	2%
Curriculum Support			2			2	0%
Skills Instruction	13	7	15			35	6%
Information Services	11	6	40			57	10%
Personnel	**38**	**28**	**27**	**2**	**1**	**96**	**17%**
General		6			1	7	1%
Roles and Responsibilities	11	9	8			28	5%
Recognition	1		2			3	1%
Leadership		5				5	1%
Professional Education	26	8	17	2		53	9%
The Field	**18**	**35**	**19**	**5**	**1**	**78**	**14%**
General		6	1		1	8	1%
History	2	1	1			4	1%
Status	5	5	7	2		19	3%
Future	2	4	2			8	1%
Ethics	1	7	3			11	2%
Legal Aspects		5	3			8	1%
The Standards	2	5		1		8	1%
Professional Literature	6	2	2	2		12	2%
Research/Theory	**10**	**5**	**4**	**1**	**2**	**22**	**4%**
Instructional Procedures	**1**	**3**	**1**	**0**	**0**	**5**	**1%**
General		1				1	0%
Distance Education			1			1	0%
Problem Solving		1				1	0%
Design & Development	1	1				2	0%
TOTAL	**171**	**180**	**180**	**24**	**13**	**568**	**100%**

changing roles and status of professionals are also evident in the literatures in both areas. Librarians continue to be concerned about image and perceptions of librarians by users, but there is also a realization that societal and technological developments are fostering new, active roles and responsibilities for information professionals. Persons in educational technology are also faced with new roles; however, the major problem is variability in job activities, responsibilities, and even job titles across locations.

Clearly, the most dominant current influence in the library and information field is technology. Authors and professionals are well aware that developments in processing power, software, and storage have the potential to affect every aspect of information management and services. New and increasingly sophisticated hardware and software systems are being applied across settings—from schools to corporations and even to the home. While first efforts to capitalize on technology often involve simple automation of manual systems, "cutting edge" research in artificial intelligence and the design of systems that combine various multi-media formats offer novel means for professionals to provide information services and for users to access and use information.

This concern with users and use is also an important theme throughout the literature surveyed. There is considerable emphasis on specific information services for a range of users as well as on planning and the management of resources for user services.

The remainder of this publication expands on these and other specific trends and issues uncovered. Although the trends and associated discussions are not exhaustive, the text does provide useful insights into the present concerns and anticipated future developments in the library and information domain.

Specific Trends and Issues

Technical Developments

Advancements in technology result in major, highly visible changes in library and information work. The technology currently receiving the most emphasis is the *optical disk*. Optical (or laser) disks are available in various formats such as read only CD-ROM and write once-read many (WORM), and can be applied to a range of information situations: online catalogs in academic libraries, public libraries, and school library media centers; specialized databases in various subject areas; full-text information sources.

As CD-ROM and other hardware and software systems appear and are applied across environments from schools to corporations, the focus in the literature goes beyond any individual technology to looking into the integration of technologies. Later, the focus shifts even more dramatically to speculating on the impact of the various innovations on users and library and information environments.

TREND #1: CD-ROM has emerged as a major technology for providing access to a range of information systems, e.g., bibliographic retrieval systems, databases, library catalogs, full-text systems.

Optical disk technology in the form of CD-ROM is clearly the technology of the present. The literature is filled with discussions of new CD-ROM products, the application of CD-ROM in new situations, and research and development to expand CD-ROM capabilities. The January 1988 issue of the *Journal of the American Society for Information Science* is devoted entirely to CD-ROM and includes detailed discussions on the technology, design considerations, potential markets, and products.

CD-ROM is already being used for a wide range of information products including bibliographic databases, online catalogs, and full-text reference sources. Research and development efforts related to CD-ROM involve interchangeable architectures, multi-user access through networking and other means, and transparent access across software systems. Another important development is the expansion of CD-ROM to include multiple write-read capabilities. CD-ROM is clearly a viable medium, applicable in

all types of libraries, in business and government situations, and across subject areas.

TREND #2: Advances in technology result in major changes in every type of library and every aspect of library and information work.

As CD-ROM and other hardware and software systems appear and are applied across environments, the focus shifts from the specifics of technology to considering the impact of various technologies on library and information services and use. Every type of library and general information setting is affected by technology. Articles in *College & Research Libraries*, for example, discuss the need to reinvent the library in the information age, how scholars manage information, the impact of technology on scholarship, and implementing technological change. The "Scholar's Workstation Project" at Brown University is a project designed to expand traditional academic library service beyond the centralized storehouse to a "wired" campus with students and faculty having access to information through individual workstations linked in a campus-wide network (Moran et al., 1987 pp. 5-16). While the Brown system continues to develop, the implications are clear: (1) the academic library must serve a highly computer-oriented, "wired" campus with high user expectations, (2) the nature of library and information functions on campus are changing, and (3) there are serious questions to be resolved regarding the relationship and functions of the academic library and the academic computing center.

Lewis (1988, pp. 291-304) also stresses that technology is forcing fundamental changes in higher education. Electronic technologies are transforming instruction, communication between scholars, and preservation and access to knowledge. Rather than simple automation of old systems, Lewis proposes "radical thinking and action" in the restructuring of institutions. Universities need to find new ways of funding, staffing, and organizing traditional and new information services. While these issues (and the implications noted by Moran, 1987) are presented within a higher education context, they are likely to emerge in elementary and secondary schools as well.

Other settings (archives, public libraries, information services in business and government) are influenced similarly by technological changes in terms of services and management. In fact, technological progress results in major policy and use issues

across information settings. In general, while the literature recognizes and identifies significant areas of technological impact on curriculum and instruction in schools, predicting the full impact of technological change in other settings is less detailed.

TREND #3: Technology has an impact on how information is presented and related information services.

Technology also influences the very structure and format of information resources. While computer-based information resources are still in a state of infancy, traditional formats for government publications, library catalogs, thesauri, microforms, bibliographic sources, and even monographs are already being challenged by computer-based alternatives. Attention is just beginning to be focused on full-text information sources, computer databases that combine multimedia formats, and computer-based hypermedia information stores that are interconnected through multiple points of access. Much "cutting edge" attention is being paid to "hypermedia" information systems. Hypermedia, sometimes called interactive multimedia, refers to a multimedia information store (combining text, sound, graphics, and moving pictures) in which the various information items are connected and linked in a number of ways. Hypermedia is interactive in that individuals can create their own multidimensional links among information items.

Currently, information services are affected by technology in two ways. First, computer systems can expand the methods of delivering traditional library services. The literature discusses automated acquisitions, library networks and the impact of automation on inter-library loan, serial systems, library catalogs, and reference services. Secondly, changes in the structures of information resources require rethinking the nature and scope of services based on these formats. For example, students using Wilsearch software and databases require different services and instruction than students relying on traditional printed Wilson indexes (Callison & Daniels, 1988, p. 173). Ultimately, when students use a variety of bibliographic and full-text information resources linked internally through hypermedia structures and externally through a range of local and wide area networks, they will require still different services and training. Increasing availability and capabilities for information in computer and CD-ROM forms will likely lead to increasing user expectations and demands for information services.

Management

A wide range of library management issues are covered in the reviewed literature: operations, policies and procedures, facilities, finance and budget, planning, and collection management. Despite often repeated concerns about diminishing resources, financial issues are not directly emphasized. Instead, the literature stresses the need for careful planning and evaluation of a library's role, its services and its collection, in order to ensure its healthy future.

TREND #4: Libraries of all types are incorporating planning processes into their management activities.

The library field as a whole shows a strong interest in planning. This is evident in numerous documents outlining planning processes, workshops conducted at conferences covering strategic planning, and research on forecasting and planning for change. Although program planning documents, such as planning a bibliographic instruction program, are found in the literature, the emphasis is on strategic planning.

Developing a strategic plan provides a foundation for making choices about future library directions. In a research article on planning for change, Pungitore states that planning addresses the "fundamental questions of purpose and mission: which segments of the community should [libraries] attempt to serve and how; which services should be considered priorities and which considered expendable; whether and how to involve the community in decision-making and by what criteria should services be measured?" (1987, pp. 247-48).

The need to plan for change, to anticipate future needs and restrictions, and to take a proactive rather than reactive stance to environmental factors are repeating themes. For example, the Indiana State University Libraries developed a 5-year plan which discusses expected changes and provides recommendations for meeting new needs in eight areas: the environment, user services, collection quality, collection access, retraining and reassignment of personnel, facilities, equipment, and funding (Ensor, 1987).

Some attention is given to the need to collect data prior to planning and decision-making. Planning cannot be done without information on the environment, on current service levels, and on library resources. The need to collect and manage this information has been recognized and automated models have been proposed.

Library use of management information systems and decision support systems to provide this information is a logical next step. Planning and associated activities are likely to receive increased attention in the near future.

TREND #5: Collection quality is a primary concern for libraries.

Collections remain at the heart of library services. The need to ensure collection quality has prompted discussions of numerous issues. These include how to evaluate a library's subject strengths and weaknesses, how to improve specific subject areas in the collection, how to compare collections of different libraries, and the relationship between faculty and librarians in collection development activities.

The impact of automated systems on collection management activities is evident across all types of libraries. Much attention is focused on the possible management uses of data produced by automated systems, such as circulation systems or bibliographic utilities. In particular, research reports discuss ways to conduct automated collection analysis using OCLC and RLG (see the July 1988 issue of *College & Research Libraries*) and ways to use automated circulation data to evaluate collection usage (see the Spring 1988 issue of *School Library Media Quarterly*).

Concern for the physical preservation of collections is also stressed. Preservation techniques are outlined, implementation guidelines for preservation programs are presented, and national preservation programs discussed.

Services

Libraries are in the business of providing service. The questions of what services to provide, how best to provide them, and the evaluation of existing and prospective services continue to be of major concern as reflected in the literature. A wide variety of services in all types of libraries received some attention, from providing motivational reading programs for young adults in public libraries to the evaluation of reference desk service in academic libraries to computer assisted instruction for the teaching of library skills in public schools. From the numerous services identified in the literature, three appear most prominently: literature and reading guidance, skills instruction, and information services.

TREND #6:Librarians continue to seek more and better ways to promote literature and literacy to a wide range of users, with a special emphasis on children and youth.

Literacy and promoting literature have long been the province of libraries, and this continuing trend is evidenced in the professional literature. Major issues include various approaches to fostering literacy, acquiring an understanding of the scope of illiteracy to deal with it more effectively, and the role of libraries with respect to literacy efforts and concerns, particularly in view of the current national interest in this area. A discussion of several public and private sector projects to promote reading, guides to reading materials, and bibliotherapy are a few areas receiving attention.

Many of the resources surveyed focus on programs and literature for children and young adults from the perspective of helping parents to encourage reading among children and teens through programs such as Parents and Children Together (PACT) and Parents as Reading Partners (PARP). Also noted is the necessity for the library professional to realize the reading and information needs of youth, to be aware of the best young adult books available, and to recognize the value of references such as the Young Adult Services Division (YASD) Best Books list. The concept of building readers for the twenty-first century is a recurrent theme (Whitney & Hager, 1986). Some attention was given to more specialized areas of literature promotion such as international children's books, and the use of non-fiction books for information.

Of great significance and surely a future trend is the involvement of libraries in the concept of whole language, "a philosophy of emergent literacy and how children learn. Whole language is an attitude about how children learn as well as a teaching strategy which transcends specific curricular areas and extends far beyond language arts," as defined by Ken Haycock in his essay "Whole Language Issues and Implications" in the 1988 *School Library Media Annual*. Eight separate articles devoted to the subject of whole language appear in this publication. The teaching methodologies and philosophy espoused by proponents of the whole language approach necessitate a variety of resources, cooperative learning and integrated language development, all of which impact upon the school library media specialist.

Haycock also states that the whole language movement challenges the library media specialist to move to a central position

within the school, to be a teaching partner, and to end the practice of isolating the library from the classroom program (Haycock, 1988, p. 19).

Four of the eight authors suggest that the whole language movement is simply a revitalization of older concepts with new names attached. They claim that concepts such as individualized reading instruction have been around for decades and contain many of the same components as those newly touted by whole language advocates. David M. Brown proposes a compromise between the old and the new with his idea of the "whole reader approach," in which reading is taught using a basal text for half of the reading period to capitalize on the basal's sequential skills format, with the remainder of the time devoted to individualized reading to allow for the whole language philosophy of child self-selection and the use of good children's literature (Brown, 1988, p. 39).

With Brown's view, the library media specialist would assume more responsibility for teaching children to read by creating age and grade level bibliographies for children to choose from, monitoring what children read (by printing out lists of books read for evaluation purposes), suggesting books and reading related activities to parents, cooperative planning and teaching with the classroom teacher, and a new slate of media-related activities in the library media center every week.

Though whole language appears to be taking the field of education by storm, there is still a great deal of controversy. Elements of this controversy and implications of the acceptance or rejection of the whole language concept by schools are major issues for the school library media field. Clearly, the whole language movement will have a tremendous impact upon the library media specialist with opportunities well beyond the obvious need for expanded resources.

TREND #7:Librarians at all levels recognize the importance of bibliographic instruction and the need to incorporate technology as a method and a topic of that instruction.

Librarians have willingly accepted the responsibility for educating patrons in the use of library resources and services, recognizing it as a mutually beneficial endeavor. Indications are that academic libraries are more concerned now with bibliographic instruction issues than they have been previously, as shown by articles concerning the importance of the librarian's role in teach-

ing library skills in the community college, the development of workbooks and guides for college students, and an awareness of the need to set practical standards for bibliographic instruction.

Another major issue is the potential for using emerging technologies in bibliographic instruction as well as being the topic of such instruction. The use of video and computer assisted instruction (CAI) as effective vehicles for instruction is discussed in the literature as are the techniques and strategies for teaching CD-ROM, search techniques in traditional and online catalogs, online information retrieval, and various software systems. Still emphasized are the teaching of research strategies and ways to instruct exceptional and non-traditional users.

School libraries continue to make skills instruction a top priority. Recently three issues have been emphasized: the integration of library skills with the classroom curricula, library instruction and critical thinking skills, and teaching with and about the new technologies.

The publication of *Information Power* by the American Association of School Librarians (AASL) and the Association for Educational Communications and Technology (AECT) has reinforced the idea that library skills instruction must be taught in the context of the larger school curriculum and in conjunction with classroom assignments. Interestingly, due to the delay factor, specific references to *Information Power* were **not** found in the literature, with the exception of the 1988 *ALA Yearbook*.

The Fall 1987 issue of *School Library Media Quarterly* is devoted to library skills instruction in relationship to higher level thinking skills, and *Library Trends* (Summer 1988) also carries articles concerning thinking skills and information processing. Also of note are articles concerned with teaching search strategies, particularly as related to online information retrieval systems, and user behavior and patterns of bibliographic searching.

TREND #8: Librarians are striving to provide quality information services to the widest possible constituency, with an emphasis on the need to serve special groups.

Librarians continue their efforts to get the message out about the services offered by libraries. Specifically mentioned are the national library card campaign and publicity from the Center for the Book in the Library of Congress along with general public relations programs for using libraries effectively. Identified as an

issue of particular importance is that of providing information about AIDS. In the fight against AIDS, "information is the only vaccine" (Lesley, 1988, pp. 157-158) and therefore impacts upon libraries, our information centers.

Various methods for providing services are discussed and critiqued, from distance education provided by university libraries to improvement in automated systems, to ways to predict and thus improve inter-library loan turnaround time.

Studies of users and evaluation of existing services for the purpose of providing high quality service are recurrent themes for all types of libraries. Academic institutions conduct studies to determine the needs and behaviors of users, and evaluations of reference desk services are common, as are evaluations of information use. Evaluations of specific services are also a concern: ERIC use, European educational information, off campus library services, and bibliographic services. Material availability continues to be an issue. Ciliberti (November 1987, p. 513) cites a 46% failure rate in finding information in subject and specific item searches.

Public libraries conduct patron surveys to assist in evaluating services. Schools focus on the role of libraries in the search for academic excellence and the use of the library media center and its services. *Check This Out*, produced by the Department of Education's Office for Educational Research and Improvement in 1988, gives short descriptions of model school and public library programs and services.

There is a real desire to provide services to all types of constituents as evidenced by articles concerned with the need for a proactive role on the part of academic libraries in faculty research, and a study of a janitorial staff to probe the information world of low skilled workers. A major issue is public awareness of and service to special groups: the handicapped, the aging, youth, and the illiterate.

Attention is given to new and better tools and guides to provide information and access. These range from the very specific guides to reference collections and serials unique to particular libraries, to pathfinders and guides for ERIC, to more general guides to government publications and federal legislation, as well as directories of both domestic and international libraries and information centers.

Information access for youth has emerged as a major issue. *Library Trends* devotes its entire Summer 1988 issue to concerns regarding library services to youth. Of note are articles focusing on services to Hispanic young adults, the young adult search for values in literature, and the information thinking skills and processes required to prepare young adults for the Information Age. Also along this line is "Inventing the Electronic University" (Lewis, 1988, p. 291).

Forming partnerships to foster better service is also considered important. Cooperation among similar types of libraries through formal networks is a long-term trend in the library field. Today, however, there is an increased interest in linking across all types of libraries—public, school, academic, and state libraries.

Quality service no doubt will remain an area of paramount interest and concern. It is what libraries are all about. Promoting literature and literacy continues to be a trend at the forefront, as do bibliographic and skills instruction. Technology has had an impact on services provided and surely will be an issue of the future.

Personnel

The status of the library and information professions receives widespread attention. Librarians' education, their roles and responsibilities, and their image are all addressed in the literature.

TREND #9: Professional image, identity, and status remain major concerns across the library profession.

Professional image and identity are recurring themes for all types of information professionals. Although librarianship is well established, it seems that all types of librarians are still concerned with "image" (Stevens, 1988, p. 825). Aspects of this concern include self-image, image in society, and the perceptions of librarians by users. There is also the question of the status of librarians in relation to information management, information science, and other professions under the "information" umbrella.

For example, the school library media literature raises two issues: (1) the place of the school library media program in the schools, and (2) the place of school library media within the library professions. Authors encourage library media specialists to move to center stage in the schools by becoming centrally involved with schools' curriculum, and school libraries are increasingly involved in library cooperation and networking efforts.

The question of supply and demand for school librarians is also raised in the literature. Research reported in *School Library Media Quarterly* (Turner & Coleman, 1987) noted that the supply and demand are geographically dependent. Some areas of the country noted deficiencies while others had surpluses. A major difficulty in the field is lack of geographic flexibility. Library media specialists in search of a job are generally unwilling (or unable) to move to areas where there are shortages.

Establishing a unified identity for professionals within the field, given the variety of job environments and job responsibilities, is another area of concern. Oen and Cooper succinctly state the concern:

> Because it is hard to establish a long-lasting identification with a moving target, information professionals have not yet established a strong identity for themselves or even a uniform definition of their field. The current multiplicity of labels used for this young profession is a fragmenting influence where unifying factors are needed. (Oen & Cooper, 1988, p. 357).

Different methods for developing a unifying identity for information professionals are discussed, including the role of professional education.

Creating a positive image that accurately reflects the responsibilities of library and information professionals is still a concern for many in the field. Research and opinion pieces address how well others (including administrators, teachers, and users) understand what information professionals do. A concern that constituents do not recognize the skills or expertise of the library professional is evident, but also the acknowledgment that librarians themselves must turn this around. The need for recognition of what information professionals currently do is tied closely to expanded roles for information professionals.

TREND #10: Expanded roles and responsibilities for information professionals are being explored.

Not surprisingly, the majority of the literature on personnel focuses on the future and on expanding roles for information professionals. Two themes are evident: (1) the need for librarians to take a proactive approach to their traditional activities, and (2) the possibilities for information professionals to take on new roles

connected to the opportunities provided by emerging information technologies.

Articles identify opportunities for librarians to be more involved in faculty research, student instruction, staff development, and administrative responsibilities. The rationale for expanded responsibilities in these areas is based on encouraging librarians to reinterpret "traditional" library skills, to explore new ways of putting those skills to work, and to promote themselves to the administration. All of the documents indicate that librarians should be taking a more active role in the larger school or university environment.

The attention on automated library services, models for "electronic libraries" and for merged libraries and computer centers noted earlier, also has an impact on librarians' roles. While the literature emphasizes the present need for librarians to be computer literate, the future will require even more. These models advocate that librarians take responsibility for information management and information provision that are not tied to the traditional collection, but to databases.

Professional Education

The significant amount of attention that professional education receives in all the document types reviewed indicates the extreme importance of this area. Introducing the September 1988 *Journal of the American Society of Information Science* issue on professional education, Cooper and Lunin identify some of the questions which reappear frequently. They ask:

> What comprises information studies and where is it being taught? . . . How can seasoned practitioners maintain currency and extend their competencies? What should prerequisites be for those who enter the field? What do prospective employers expect from graduates of various programs? What should schools teach to prepare their graduates for productive employment, both currently and in the future in the information world? (Cooper & Lunin, p. 308)

TREND #11: Professional education programs are being challenged to balance the need to provide training in specific areas with comprehensive, coordinated programs covering all areas of information science.

The relationship between what is being taught in library and information science programs and what employers and prac-

titioners in the field believe should be taught receives much attention. Practitioners are holding academic programs responsible for providing professionals trained in specific areas, such as bibliographic instruction, map librarianship, and especially archival techniques. How well academic programs are responding to the needs of the field currently is being debated.

On the other hand, from the perspective of the educators, the focus seems to be on developing coherent programs addressing the wide range of responsibilities that information professionals have and the various settings in which they work. Educators are faced with meeting specific needs, as noted above, but also feel a responsibility to provide an educational introduction to a wide information world. Changes in library and information science programs reflect attempts to do both. Changes range from the addition of new programs with new degrees (such as information resource management) to the restructuring of courses to include competencies and performance indicators, to increased program requirements for graduation. For a discussion of several schools' programs, see the September 1988 issue if the *Journal of the American Society of Information Science*.

Library and information science programs will continue to change. At least one author believes that major restructuring is still to be done:

> What has yet to occur, however, is the clear emergence of a new discipline, with full scale professional degree programs that take a broad view of information and are able to synthesize the relevant content from existing disciplines, give this content new form, develop distinctive research directions, and produce the graduates who will be the leaders of the information age. (Garrison, 1988, p. 364)

TREND #12: More continuing education opportunities of all types are needed.

Continuing education issues receive even more attention than formal education. The importance of updating skills and learning more advanced skills is evident from the amount of interest in this area. This obviously reflects the ever-changing nature of information technology, but also highlights a concern that information professionals need to be prepared to take on administrative responsibilities.

In an effort to identify librarians' sources of professional knowledge and to understand better how professionals keep up to date, several studies examine librarians' use of literature, continuing education programs, workshops, peer networking and on-the-job training (Stenstrom & Tegler, 1988; Powell, 1988). Powell (1988, p. 332) found that while library school and on-the-job training provide most of a librarian's professional knowledge, librarians would prefer to acquire more training from continuing education and staff development programs.

In terms of the content of continuing education programs, the focus remains on practical skills. In particular, computer and management skills were most desired. The increasing use of computers and related technologies in libraries and the ever changing nature of information technology point to an ongoing need for technology training. The need for management skills reflects the trend for many librarians to move quickly into supervisory or administrative positions without having had the benefit of management training in library school.

The Field

The "field" of library and information science encompasses a wide scope. While librarianship is well established with long-standing traditions, information science is relatively new. Much of the attention already described relating to personnel and professional development, particularly in relation to new and emerging roles for librarians and the development of new positions for information professionals, is mirrored in discussions about the field.

Another common theme related to the field is a future orientation. Professional organizations such as the American Library Association (ALA) and its affiliates, the American Society for Information Science (ASIS), and the Library of Congress and other library institutions are continuing to look to the future. The 1988 ASIS conference was entitled, "Information & Technology: Planning for the Second 50 Years," and the 1988 ALA conference, "Visionary Leaders for 2020." Libraries in the future will be the focus of the White House Conference on Libraries and Information Services scheduled to be held between September 1, 1989, and September 30, 1991.

TREND # 13: *Information Power*, the new guidelines for school library media programs, is expected to have a major impact on the school library media field.

The major development in 1988 in terms of standards was the publication of the new school library media standards, entitled *Information Power* (1988). Jointly formulated by the American Association of School Librarians and the Association for Educational Communications and Technology, *Information Power* presents an active, forward role for library media programs based on the library media specialist functioning in three roles: as information specialist, teacher, and instructional consultant. Discussions of *Information Power* are just beginning to appear in the literature, although the publication has already been presented to educators at all levels. One of the major differences that distinguishes this from previous efforts is that *Information Power* is presented as recommended "guidelines" for various levels of program effectiveness rather than as minimal or even exemplary "standards."

Another major trend relating to standards is cooperation across accrediting agencies. The American Library Association (ALA) has been working with the Society of American Archivists to develop joint standards and to cooperate on education activities. ALA is also seeking approval for developed "curriculum guidelines for the preparation of school library media specialists" from the National Council for Accreditation of Teacher Education (NCATE).

TREND #14: Information professionals recognize that they have major ethical responsibilities, particularly relating to freedom of and restrictions on information.

The major ethical issues noted in the literature concern government information policy. Kranich (1988) notes government reductions on publishing output and information dissemination activities and that librarians are fighting attempts to limit access to government information. In 1987, members of the ALA Coalition on Government Information, an organization representing over 50 groups, raised issue with a number of government actions including FBI surveillance activities in libraries, proposals to trim back the 1990 census, and telecommunications charges on services that provide access to databases.

Federal policy in terms of information technology is also an issue. McClure et al. (1988) note that existing federal government

scientific and technical information (STI) policy, as set by the Office of Management and Budget (OMB), discourages the effective use of information technology. This in spite of reports by the U.S. Office of Technology Assessment (OTA) that new information technologies "could revolutionize the public information functions of government" (U.S. OTA as quoted in McClure, et al., p. 8).

Research/Theory

Much research activity centers around the design and development of improved information systems. This includes areas of traditional interest to information science (e.g., retrieval mechanisms) as well as new research efforts that integrate various media formats and seek to apply developments made in artificial intelligence (e.g., natural language understanding). Researchers in library and information science also continue to work in more theoretical areas.

Trend #15: The traditional concerns of information retrieval (e.g., retrieval mechanisms, measurement and evaluation, human needs and behavior) continue to receive considerable research attention.

Research into improving information retrieval mechanisms remains a major concern of information science and is reflected in journal papers and conference proceedings. While there is still much discussion of probabilistic and other retrieval methods, ranking algorithms, and alternative search strategies, the efforts have expanded to include work in full-text systems and CD-ROM. For example, in the May 1988 issue of *Journal of the American Society for Information Science*, Saracevic and others describe a major research project on full-text searching, users, and information retrieval. Performance evaluation and measurement issues also remain as primary concerns. Studies focus on the nature of relevance and utility, performance measures, and traditional recall and precision. Beyond system aspects, there is also significant research on human aspects: users' needs, questioning and the interview process, and modeling the search processes of users and professional searchers.

TREND #16: New research efforts in information systems include (a) the development of information systems integrating various formats and structures, (b) the

development of sophisticated user interfaces, and (c) the application of artificial intelligence to information systems.

In an opinion paper, Sparck-Jones (1988) identified these three trends in information management and systems development. **Integrated formats** and structures refers to systems that include a range of media (text, pictures, graphics) and document types (reports, papers, tables, charts, letters, user comments). **User interfaces** involve increasing workstation capabilities, multitasking, linked operations, flexibility and convenience, multiple windows, pull-down menus, and hypermedia. True **artificial intelligence** applications go beyond interpreting natural language queries or text to systems that expertly interpret information from a context of broad knowledge bases in fundamental subject areas.

Sparck-Jones goes on to note the underlying assumptions, limitations, and problems with each of these areas. She notes, for example, that we are dealing with very different kinds of objects, physically and logically. Still pictures, animation, and text present substantially different physical storage and retrieval problems. In addition, these different physical formats often deliver very different logical messages. Ultimately, we are likely to be dealing with substantially different uses for the same information presented in different formats (Sparck-Jones, 1988, pp. 705-706).

These three areas—multifaceted information systems, user interfaces, and artificial intelligence applications—represent three distinct trends in research. While the effort required in each area is substantial, Sparck-Jones stresses the relationship among all three. Multifaceted information systems require sophisticated interactive terminal interfaces to support the efficient use of information offered through a range of formats, and both of these areas require intelligence-supporting features to aid users in complex information management. Regardless of whether they are treated separately or combined, all three are fundamentally technology-based and describe major trends in technological research in that (a) they point to uses of technology, and (b) they were not possible to do until technology had reached its current state of sophistication. A major related issue concerns the evaluation of such systems. What are the appropriate experimental strategies? What is the role of the end-users? What is the relationship between real system performance and satisfaction?

TREND #17: Researchers continue to apply concepts, methods, and theories from related fields to the problems of library and information science.

One of the characteristics of research in library and information science is the trend of looking to other fields for methods and concepts that may be applicable to library and information science. This is due, in part, to the integrating nature of library and information science. "Information" touches on all fields, and it is natural that researchers in information studies look to other areas. Fields currently receiving attention include linguistics, computer science, statistics and measurement, communication, cognitive psychology, and other behavioral sciences. Interest in natural language processing combines both artificial intelligence research from computer science and text analysis work from linguistics. A recent dissertation looks quantitatively and qualitatively at the impact of linguistic theory on library and information science (Warner, 1987).

There is also an increasing interest in the study of users and user behavior. Specific projects include investigations of library users, decision-makers, general information seeking behavior, and user world models. Efforts draw on work in cognitive psychology, communications, and other behavioral sciences.

Researchers are also interested in a range of methodologies and new approaches to studying the problems of information science. For example, included in the *Proceedings of the 1988 ASIS Annual Conference* (1988) are papers on: methods for studying information behavior in non-technical environments, empirical methods for assessing information retrieval performance, basics of statistics, and new approaches to the study of information seeking behavior. The field continues to investigate both quantitative and qualitative research methodologies. As noted above, much of the current interest in user behavior and user studies involves applying methodologies developed in communications and behavioral sciences.

TREND #18: Bibliometrics continues to receive major research interest.

Bibliometrics is the statistical study of literatures, e.g., productivity by authors, subject coverage in journals, and analysis of citations. It is one area of research that is unique to library and information science and remains a continuing interest to the field. Research efforts documented in the literature include studies of

geographic journals, analyses of journal literatures, growth of specialist journals, Zipf's law and Bradford's law, and analysis of research articles in core journals.

Conclusion

The nineteen trends noted above provide information on major current concerns in the library and information field as discussed in the professional literature. The field is clearly focusing on trends and issues in computer technology, services, and planning. Professionals and researchers are beginning to consider how technology is changing the very nature of how information is packaged and offered to users. In terms of services, the move across the information professions is towards active, user-oriented services to a wide range of constituents. Similarly, trends in management indicate active, planned approaches to meeting user needs.

Beyond systematically analyzing and documenting current trends, it is hoped that the baseline information provided by this monograph will be useful in tracking future changes in emphasis and focus. The intention is to repeat the analysis and report trends and issues on a bi-annual basis.

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Appendix A: Content Analysis Methodology Used in This Study

Alan Januszewski and Michael Eisenberg

Purpose

The Educational Resources Information Center (ERIC) attempts to generate syntheses of the literature of various academic disciplines and other areas that contribute to the field of Education. The purpose of this publication is to provide some indication as to where the field of library and information science is going. The identification of emerging trends and issues is a first step in this endeavor.

The ERIC Clearinghouse on Information Resources specializes in the areas of educational technology and library/information science. In order to determine and document trends in each of these areas, the authors formally analyzed one-year samples of the literature from each area. The results of the survey of library and information science literature form the basis for the above discussion of trends and issues in library and information science. The parallel survey of educational technology literature is reported in IR-80, *Trends and Issues in Educational Technology 1988*.

The sample of the literature analyzed is from only a single-year period (October 1987-September 1988). It was necessary to develop a methodology for the identification of emerging trends that allows a large number of documents to be reviewed in a reasonably short period of time. The one year time period was one way of accomplishing this. The authors acknowledge that this limits the verification of trends over a long period of time. Still, clearly discernable patterns do emerge from the literature. Also, this first effort is conceived as a reference point for future identification of trends in library and information science. It is anticipated that this study will be conducted every two or three years. This longitudinal expansion will add to its overall usefulness.

Content Analysis: Some Background

A form of content analysis is used in this study to determine the emerging trends and issues relevant to library and information science. A trend is considered to be a cumulative indicator of

activities or products that shows direction. An issue is considered to be a problem or a question for which there are multiple points of view. It is important to note that a trend may be considered by some to be an issue. As a problem or question develops within an academic field, it may be considered an issue. The distinction between these two concepts is not as clear as one might like it to be.

Content analysis is intended to be a method for the objective and systematic collection of pre-specified data for the purpose of identifying the special characteristics of those data (Carney, 1972). It is a broad concept that can be used in any attempt to practice research or science. Whenever symbolic action or communication is the subject of investigation, the analysis of content is involved (Janowitz, 1976).

Not all content analysis is the same: there are both quantitative and qualitative strains of content analysis. A common form of the qualitative type of content analysis is conceptual analysis, i.e., the investigation of the use and meaning of particular words. A common type of quantitative content analysis is the measurement of the length of articles that deal with a predetermined topic. A tabulation of the results of either of these forms of content analysis is required in order to make any inferences about trends. Examples of the use of content analysis as a methodology have appeared in both the popular and the academic press. John Naisbett's *Megatrends* (1982) identified 10 trends that he thinks will become influential in our lives. Morris Janowitz (1976) outlines the application of content analysis to determine socio-political trends from a sampling of our nation's newspapers.

Reviews of the advantages, limitations, and features of content analysis can be found in Carney (1972), Hosti (1969), and Janowitz (1976).

Content Analysis in This Study

The professional literature of a field indicates the concerns, inquiries, and research that are important to that field. Such is the case with the literature of library and information science. It was decided that a review of the professional literature of library and information science would reveal the ideas that were of importance to the field. Through this process it was hoped that indications could be derived about the direction (emerging trends and issues) of the field. The basic idea behind this study was that if one could classify and tabulate pre-selected writings based on

interpretations of the authors' purpose it would be possible to indicate current directions in the field.

In order to achieve this end, it was determined that a substantial number of source items would have to be reviewed. Because this study was primarily concerned with the number of times that a topic was discussed (as opposed to the length of the discussion or the particular use of the concepts involved in the discussion), and given the resource constraints (limited time and manpower), it was decided that a content analysis would be the appropriate data collection technique, but that a "hybrid" form of content analysis would have to be developed for the purpose of this study.

It was imperative that the data collection teams be able to review and classify sources efficiently and effectively, while avoiding the pitfall of playing "fast and loose" with the data. The general steps in this study are outlined as follows:

- The conceptualization of the recording units and categories.
- The determination of the sources to be reviewed.
- The specification of the data collection procedures.
- The analysis of the data.

It is reasonable to state that the vast majority of content analyses that are concerned with determining trends must somehow address these steps. However, these particular tasks do not always occur in the order in which they were performed in this study. A reordering of tasks can be the difference between inductive and deductive studies. In this study we use a deductive methodology. Because of the nature of the content that is specific to each field in trends research, there is no one right way to do content trends analysis. Hence, by necessity, it is a hybrid methodology. It is important to acknowledge that each type of content analysis has its own advantages.

Conceptual Categories into Operational Definitions

The general content categories that were used in this study were based on the concept of the functions performed by media personnel discussed by Chisholm and Ely in 1976. This conceptual scheme is similar to divisions used by Prostano and Prostano (1987) and *Information Power* and older standards and thus indicative of the field of library and information science: Personnel, Management, The Field, Instructional Processes, Information Services, Technical Developments, and Research and Theory. The

content categories were determined before the study began rather than during the review of the data sources. In this sense the categories were "imposed" upon the study rather than generated in a more inductive fashion. This conscious decision was based on the need for efficiency in the data collection process. After the general content categories had been identified, subcategories were specified. Some were added later during the data collection process. The specification of these components was based on a thorough knowledge of the literature and extensive experience in professional practice. An example of one of the conceptual categories is the function of "management." The broad concept of management was operationalized by specifying the following tasks: planning, budgeting, diffusion and implementation, logistics, operations, and facilities.

Two instruments had to be created for this study. The primary instrument allowed reviewers to record both the source of the data and the category into which the source had been classified (see Appendix B). The second instrument served as a tally and comment sheet for each item collected and classified on the primary instrument (see Appendix C).

Content Source Units

Journal articles, dissertation abstracts, ERIC documents, and professional conference programs were chosen as the content units because they provide a current record of issues and topics that leaders in the field of library and information science have acknowledged to be important.

The analysis of the content in professional journal articles and dissertation abstracts is not new to research in the area of library and information science. For example, Feehan and colleagues (1987) reviewed issues and trends in library and information science research published in 91 English-language journals in 1984. Categories of analysis included broad subject areas and subdivisions of applied subject categories, library types, and research methods. Houser (1988) was interested in the concept of information science. He analyzed the content of the *Journal of the American Society for Information Science* from 1970-1984 to examine the nature of information science, its relation to library service, whether information science is a new branch of science, and whether a community of information science researchers exists.

The selection of journals for analysis in this study was based on a published study of perceived prestige of core journals in library science (Kohl & Davis, 1985) and recommendations from three faculty members at the School of Information Studies at Syracuse University. They are: *College & Research Libraries, School Library Media Quarterly, The Journal of the American Society for Information Science, Library and Information Science Research*, and *Library Trends*.

The dissertations that were included in this study were produced at the universities identified by White's study (1987) as schools whose faculties are perceived as contributing significantly to the advancement of the profession through research, publication, and leadership. The University of Illinois at Urbana-Champaign, the University of California at Los Angeles, the University of California at Berkeley, the University of North Carolina at Chapel Hill, and Indiana University were ranked as the top five by library educators, and were among the top six in rankings by academic research library administrators. While Bookstein and Biggs (1987) point out the problems of such rankings, their study also listed these schools as highly ranked.

Conference programs and ERIC documents were added to this particular study in order to broaden the scope of the content to be analyzed. It appeared that conference programs would reveal the latest developments in the field of library and information science because conference presentations usually discuss the most recent findings of current research and development efforts. Papers from three professional conference programs were examined, i.e., the American Library Association (ALA), the American Society for Information Science (ASIS), and the Association for Library and Information Science Education (ALISE). ALA and ASIS are the two national organizations most directly encompassing the field, and ALISE is the major professional organization for library and information science educators.

ERIC documents were included in the scope of this inquiry since the materials entered in the ERIC database represent a cross-section of the contemporary literature of library and information science. Following the basic premise of Webb (1966), the research team believed that a multiple operational approach should be emulated. The research team felt that it could have an increased level of confidence in its analysis if it increased the scope and breadth of the data included in the study.

Data Collection Procedures

The data classification and tabulation instruments were tested for their functionality. This was done by asking prospective data collectors to use the instrument to review the same three articles from one professional journal. Particular attention was paid to the conceptual clarity of the content areas, and efforts were made to identify ambiguities and confusing elements within the instruments that might mislead the data collectors into generating erroneous classifications. The graphic design of the instruments was checked to insure the efficiency and the effectiveness of the data recording process.

A training session was held for the data collectors, who were all graduate students at Syracuse University. This session was designed to teach them how to:

- Identify the purpose of an article by reading the introduction, abstract and concluding statement.
- Use the data source and classification instrument.
- Use the tabulation and comment instrument.
- Locate the data sources.

The ability of the data collectors to meet these four objectives was demonstrated by a test for inter-rater reliability. After a period of one week the data collectors met and compared the results of their interpretations of the articles from three different professional journals. The Pearson Correlation Coefficient (r) that had been calculated for the pairs of data generated by the collectors slightly exceeded r=0.8. To insure further reliability, it was decided that each data collector would designate two possible categories for each of the journal articles, a primary choice and a secondary choice. The employment of this technique virtually eliminated cases of non-agreement among the data collectors. Inter-rater reliability was virtually assured as data collectors discussed those cases where they had disagreed until an agreement could be reached.

At the conclusion of the data source recording and classification phase of the study, the data collectors tabulated the results. They reported the results of all of the dissertations on one tabulation instrument for analysis. Each of the five professional journals and each of the three conference programs that were reviewed was reported separately, as were monthly entries in the ERIC index,

Resources in Education (*RIE*). This style of reporting allowed for cross-source analysis.

The authors of this monograph also used major reports and position papers published within the time period of the study and personal observations from professional participation in national and international events to provide further input and clarification.

Limitations to the Study

There are a number of limitations to this study. First, as a form of content analysis, the study is a "hybrid." It does not enjoy the advantages of conceptual analysis, i.e., the inquiry into the use and meaning of particular terms that have a bearing on the field of library and information science. Second, it has no quantitative base other than that of tabulation. The methodology did not reveal the depth of the particular content that was used or analyzed in the sources. Third, the decision to use sources that have no precedent in content analysis (e.g., conference programs) raises questions about the data sources that were used in the study. Fourth, there is the possibility that certain items that were reviewed as source data were "specialty items." Special issues of a particular journal or a conference dedicated to a particular theme could "skew" the results of a study. Fifth, it is difficult to make statements about trends based on the data gathered in a single year since there is no earlier referent. Finally, the attempt to emulate the multiple operational model of analysis was not a true one. Since multiple operationalism is an attempt to bring several different methodologies to bear on a particular question or concern, this study could be considered as a cross-methodological meta-analysis. Although attention was given to increasing and varying the amount and types of data sources used to analyze trends and issues in the field of library and information science, the study used a single methodology.

Recommendations for the Future

It is more than an exercise in humility to acknowledge the limitations of a particular study: it is intellectual honesty. Three goals were set forth at the beginning of this study. The first was to provide an indication of the emerging trends and issues in the field of library and information science. The difficulty of recognizing trends based on data gathered from a relatively short time span has already been mentioned. But certainly the number and variety of sources utilized make the analysis provided here more than an "educated guess." The second goal of this study was to develop a

data source that will serve as a baseline so that trends in the field of library and information science can be more easily recognized in the future. It is much easier to have confidence in having met this second goal. The data that have been gathered during the course of this study will presumably be used by future analysts, as they provide a tabulation of the professional discussions about what comprised the field of library and information science in 1987-88. The third goal of this study was to develop a methodology that will allow an expedient review of the professional literature of the field of library and information science. Here, too, it is easy to feel confident about having met the goal; however, there is still much to be done in this regard. The instruments require some refinement. Data sources must be reconsidered. Integration of other types of trend and issue analysis into this methodology should be addressed. Webb, Campbell, Schwartz, and Sechrest recommended the technique of multiple operationalism, asserting that "once an idea has been confirmed by two or more in dependent measuring processes the uncertainty of its interpretation will have been greatly reduced" (1966, p. 3). Resource and time constraints precluded the use of other data-gathering techniques and contribute to limitations of this study. The decision to broaden the scope and number of content sources sampled, however, increases the level of confidence that can be placed in the data. These are questions that must be faced at the beginning of any such trend analysis. Surely more such questions will emerge. Upon the completion of this phase of this infinite enterprise one can only think that long journeys start with small steps.

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Appendix B

RECORDING UNITS - TRENDS REVIEW

Document Name: Reviewer:

TRENDS	Tally	Comments
The Field		
History		
Status		
Future		
Ethics		
Legal Aspects		
The Standards		
Personnel		
Roles/Responsibilities		
Recognition		
Certification		
Leadership		
Professional Education		
Management		
Organization		
Logistics/Operations		
Procedures/Policies		
Facilities		
Finance/Budget		
Planning Processes		
Technical Developments		
Computer Related		
Telecommunications		
Video		
Audio		
Photography/Holography		
Instruct'l Proc./Services		
Distance Education		
Simulations/Games		
Problem Solving		
Evaluation		
Interactive (video)		
Design & Development		
Services		
Lit. and Rdg. Guidance		
Curriculum Support		
Skills Instruction		
Information Services		
Research / Theory		

Appendix C

TRENDS REVIEW - ARTICLE LOG

#	Title	Source	Date	Category
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